



Queensland University of Technology
Brisbane Australia

This is the author's version of a work that was submitted/accepted for publication in the following source:

Haque, Md. Mazharul & Chin, Hoong Chor (2009) Costs of road accidents : an update. In *GRSP/ASIA Road Safety Seminar 2009 Towards A Decade Of Action*, 7-8 Oct 2009, Singapore. (Unpublished)

This file was downloaded from: <http://eprints.qut.edu.au/51256/>

© Copyright 2009 the authors.

Notice: *Changes introduced as a result of publishing processes such as copy-editing and formatting may not be reflected in this document. For a definitive version of this work, please refer to the published source:*

Please cite this article as:

*Chin, H. C. and Haque, M. M.
(2009)''Costs of road accidents: an
update'', GRSP/ASIA Road Safety
Seminar – Towards A Decade of Action,
Singapore.*

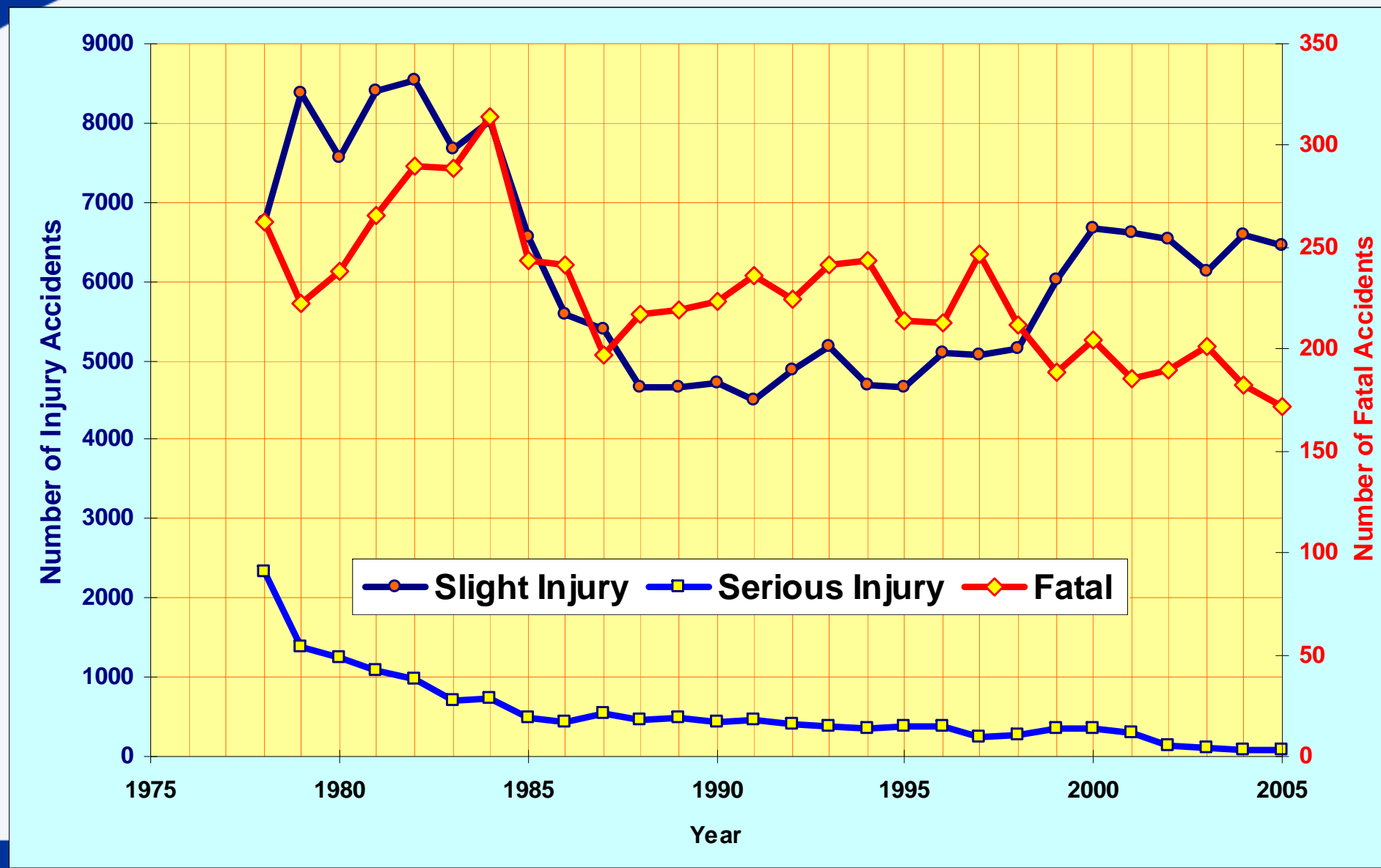
COSTS OF ROAD ACCIDENTS: AN UPDATE

**Authors: Chin Hoong Chor
Md. Mazharul Haque**



Md. Mazharul Haque
Research Engineer
National University of Singapore

ACCIDENT TRENDS



SOME INTERESTING STATISTICS

	ROAD TRAVEL	AIR TRAVEL	REMARKS
Total annual deaths (Worldwide)	1.17 million (65% pedestrians)	<1000 (few non-passengers)	Not all air crashes are accidents
Chance of being killed in a trip (US)	1 in 7.6 million trips	1 in 56.7 million trips	Car trips are shorter

Road accidents are given less attention than other transport accidents

- More common
- Mostly and easily blamed on drivers or road users
- Less dramatic
- Less valued by media
- Standard compensation and often not disputed

IMPLICATIONS

Taken in total, road accidents are very costly

- Actual cost not appreciated
- True cost is not computed
- Hampered by insufficient information

Where estimates are available, cost of road accidents is high, for example: a fatal accident in

- USA : US\$977,000 (2000 prices)
- UK : £1,445,000 (2000 prices)
- Australia : A\$850,000 (1996 prices)

QUESTION

What is the cost of traffic accidents in Singapore?



AGENDA

Methodology

Estimation procedure

Cost Estimate

Cost components

Component cost estimates

Overall economic cost of accident types

Closing Comments

METHODOLOGY

IDENTIFY METHOD OF ESTIMATION

Review available
methods

Identify Cost
components

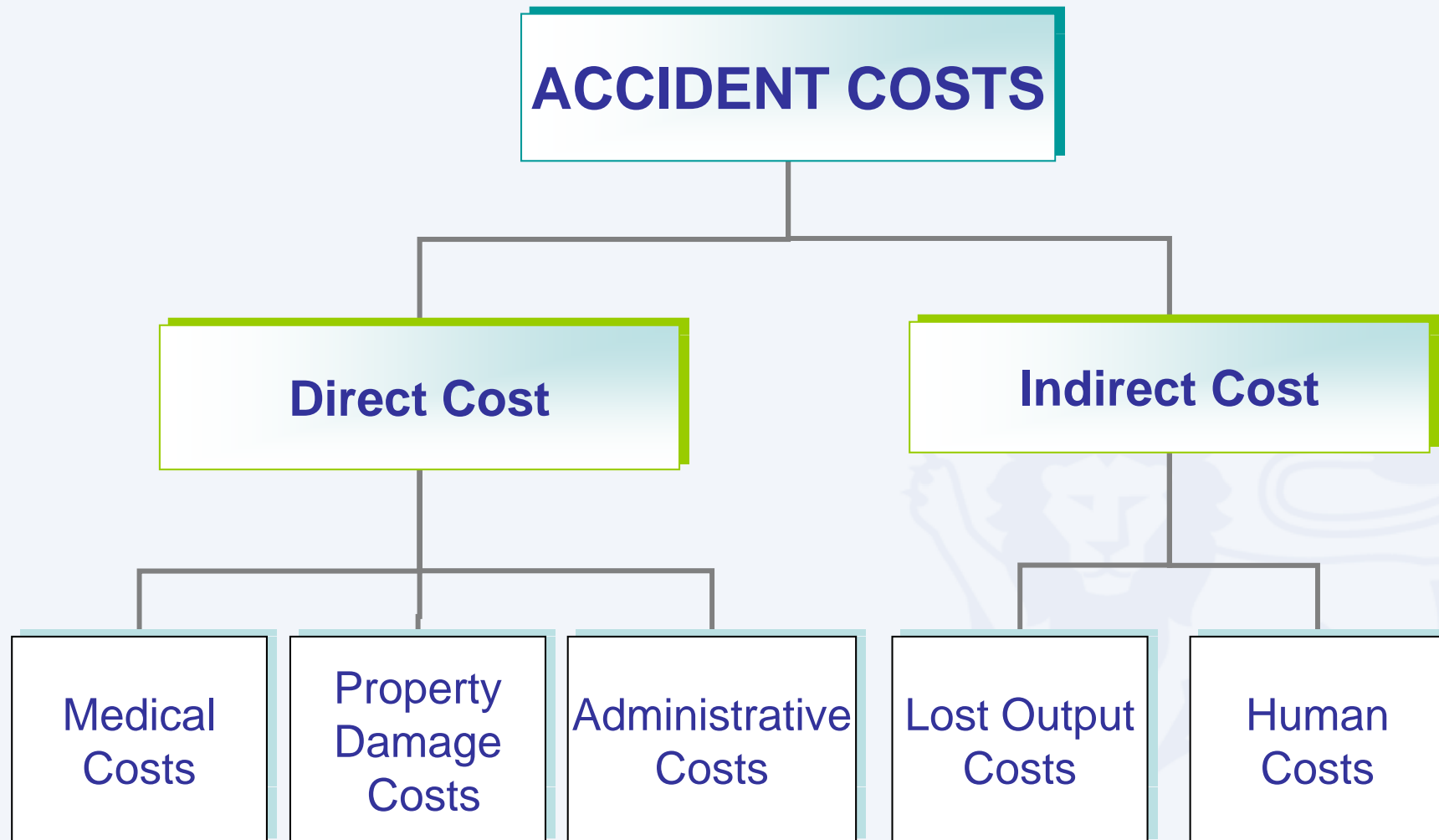
Assess
availability of data

ESTIMATE COSTS

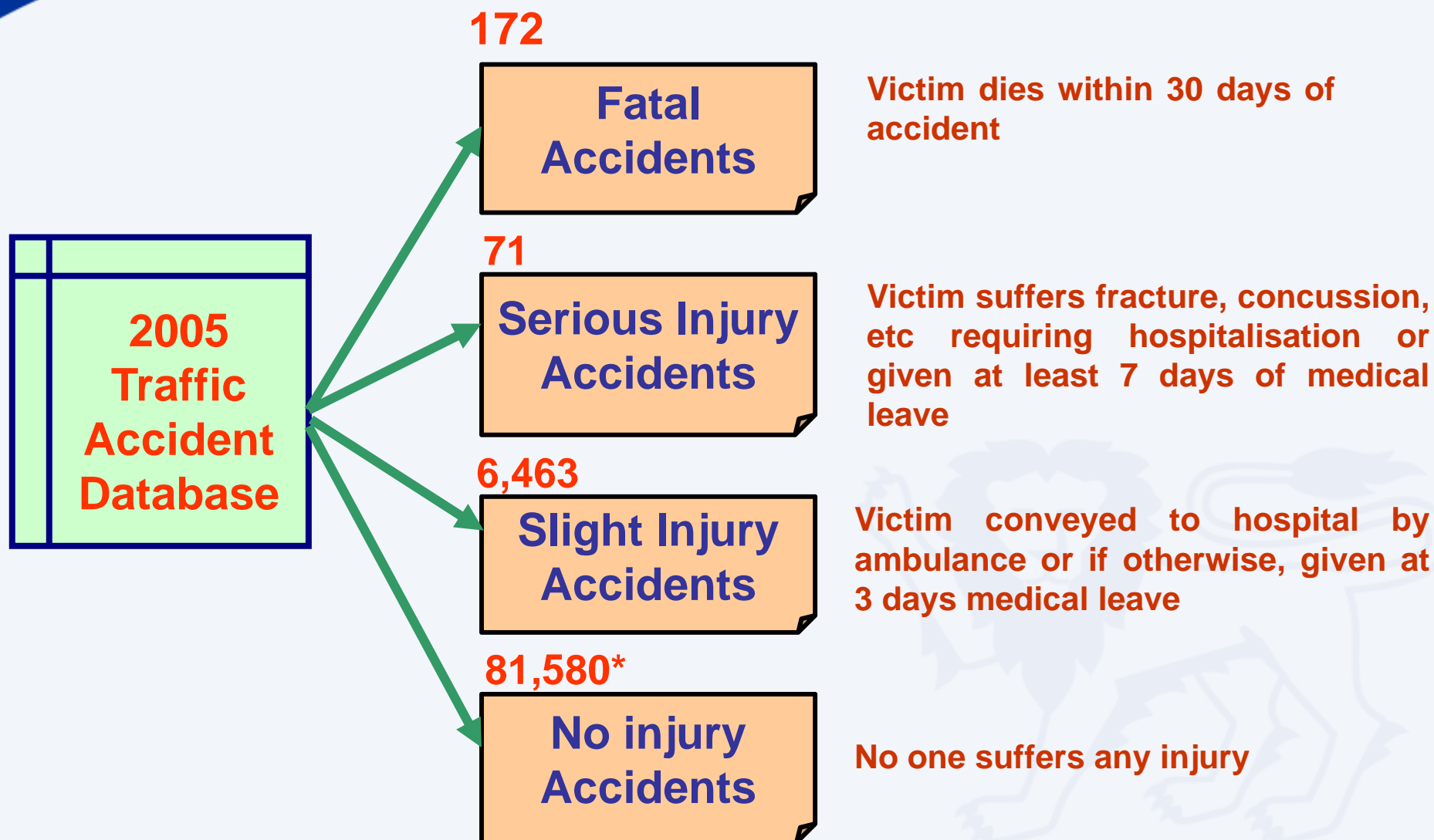
Estimate individual
components

Compute overall
cost

COST COMPONENTS



DATA SOURCE



MEDICAL COSTS

MEDICAL COSTS

- First aid
- Immediate hospital treatment
- Intensive care
- Room charges
- Medication and Diagnosis
- In-patient medical care
- Surgeon/specialist services
- Nursing care
- Special aids

Extensive Hospital Survey on specific hospital charges per RTA victims (based on 2003 survey at SGH and moderated with KKH 2005 data)

FATALITY

S\$1,642

**SERIOUS
INJURY**

S\$16,475

**SLIGHT
INJURY**

S\$1,636

The 2005 costs were computed based on an inflation rate of 3.18% per annum on medical expenditure (between 2003 and 2005)

PROPERTY DAMAGE COSTS

PROPERTY DAMAGE

- Vehicle repair/replacement
- Public infrastructure repairs/replacement

GENERAL INSURANCE ASSOCIATION OF
SINGAPORE
Insurance records of claims

Not all
damaged
items are
insured!

FATAL
ACCIDENT

S\$8,795

SERIOUS
INJURY
ACCIDENT

S\$8,295

SLIGHT
INJURY
ACCIDENT

S\$3,975

NO-INJURY
ACCIDENT

S\$2,331

The 2005 costs were computed based on an inflation rate of 1.07% per annum on general expenditure (between 2003 and 2005)

ADMINISTRATIVE COSTS

ADMINISTRATIVE SERVICES

- Police enforcement
- Police accident investigation
- Ambulance & fire services
- Legal / Court services etc.

The 2005 costs were computed based on an inflation rate of 1.07% per annum on general expenditure (between 2003 and 2005)

POLICE
DEPARTMENT
EXPENDITURE

GENERAL
INSURANCE
ASSOCIATION

AGGREGATE COST

FATAL
ACCIDENT

S\$39,030

SERIOUS
INJURY
ACCIDENT

S\$6,245

SLIGHT
INJURY
ACCIDENT

S\$3,903

NO-INJURY
ACCIDENT

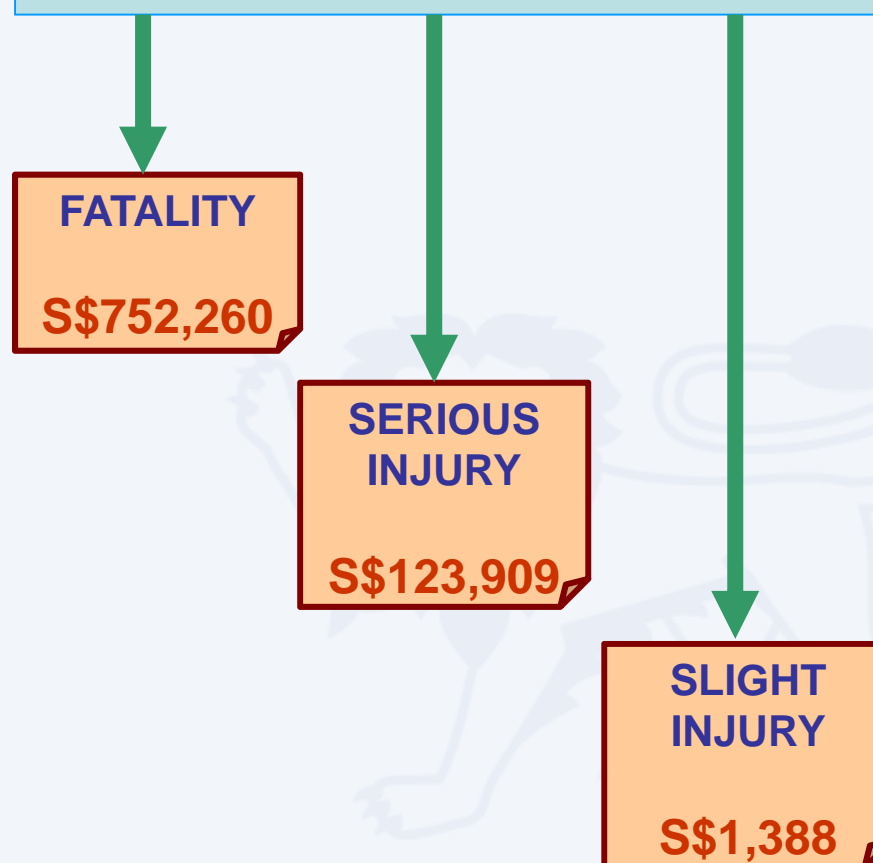
S\$780

LOST OUTPUT COSTS

LOST OUTPUT

- Wage Rate
- Occupation of victim
- Hospitalisation and/or medical leave (absence from work)
- Age of victim (in case of death)
- Average productivity

Distribution of RTA Lost Output Cost per victim



HUMAN COSTS

PAIN, GRIEF & SUFFERING

(Subjective estimate)

- Physical and mental suffering of victims
- Trauma and damage to quality of life

Medical cost is deducted from Court awards to calculate the Human cost

FATALITY

S\$15,946

**SERIOUS
INJURY**

S\$37,869

Adjusted

**SLIGHT
INJURY**

S\$4,835

CASUALTY RATES PER ACCIDENT

	Fatal casualty	Serious injury	Slight injury
Fatal Accident	1.00581	0.06977	0.34884
Serious Accident	-	1.05634	0.30986
Slight Accident	-	-	1.26025

OVERALL COST

COST ELEMENT ACCIDENT TYPE	COST (S\$) PER VICTIM			COST (S\$) PER ACCIDENT		Total (S\$) (per acc.)
	Medical costs	Lost output	Human costs	Administrative costs	Property costs	
Fatal	1,642	752,260	15,946	39,030	8,795	837,475
Serious Injury	16,475	123,909	37,869	6,245	8,295	205,265
Slight Injury	1,636	1,388	4,835	3,903	3,975	17,780
Damage Only	0	~ 0	0	780	2,331	3,110
Aggregate						S\$527.25 million

- Estimate is conservative
- Annual Cost of RTA is about S\$527.25 million ~ 0.3% of GDP

CLOSING COMMENTS

❑ Accident Cost is very high

➤ Based on 2005 figures:

➤ Total cost of road accidents is S\$527.25 million

➤ This amounted to S\$1.44 million per day

➤ This was about 0.3% of GDP in 2006.

➤ Property damage constitute a high proportion of the total accident cost (up to about 50%).

➤ The computed cost per fatal accident is S\$837,475.

❑ Research Efforts are needed

➤ Reducing the number of fatal accident will result in huge economic saving.

➤ There is high economic returns in any research effort that can reduce accident severity and frequency.

➤ Resources devoted to road safety programs should be justified on the basis of reduction in economic costs.

END OF PRESENTATION

References

Chin H.C., **The Cost of Traffic Accidents in Singapore**, Urban Transport IX, The Built Environment Vol 64, WIT Press, Southampton, 2003.

Chin H.C, Tan E, Melhuish C, Ross A, and Goodge M. '**Road Accident Costs in Singapore**', ADB-Asean Regional Safety Program, Accident Costing Report: AC 08. 2003.

Chin H.C., Haque M. M., and Yap, H. J. '**An Estimate of Road Accident Costs in Singapore**', In Proc. International Conference on Road Safety in Developing Countries, August 2006, Dhaka, Bangladesh, pp. 28-35.

Acknowledgements

Asian Development Bank

General Insurance Association of Singapore

Land Transport Authority

KK Women's and Children's Hospital

Singapore General Hospital

Singapore Traffic Police